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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/802,162	03/08/2001	Robert Getts	4081.005	6213

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EXAMINER	
CHUNDURU, SURYAPRABHA	
ART UNIT	**PAPER NUMBER**
1637	

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/802,162	GETTS, ROBERT	
	Examiner	Art Unit	
	Suryaprabha Chunduru	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' response to the office action filed on January 12, 2006 has been entered.

Status

2. Currently claims 1-42 are pending. New claims 35-42 are added. All arguments have been fully considered and thoroughly reviewed, and are found not persuasive for the reasons that follow. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

New issues

Objection to the Specification

3. The specification is objected because of the following informalities:

(i) This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply the requirements of 37 CFR 1.821 through 1.825.

The instant application recites sequences that are not identified by SEQ ID No. (see at least page 17) recite a nucleic acid sequence / amino acid sequence with more than 10 nucleotides or 4 amino acids, which is not identified by SEQ ID NO.).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in

the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Note: the following rejection is re-written to include new claim (claims 39-42) limitations.

A. Claims 1-26, 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dellinger et al. (USPN. 5,853,993) in view of Nilsen et al. (USPN. 5, 487,973).

Dellinger et al. teach a method claim 1-2 and 18, for detecting nucleic acids on a solid support, wherein the method comprises

1) (a) taking an immobilized capture probe (see column 4, lines 50-67, column 3, lines 44-50);

(b) taking a first component comprising DNA reagents (target analyte comprising mRNA having a capture sequence (homopolymeric tailing or Poly A or poly U tail) (see column 3, lines 20-24, column 5, lines 4-14);

(c) taking a second component (reporter probe) comprising having at least on first arm comprising label and at least one second arm having a second nucleotide sequence which is complementary to the homopolymeric region on the target analyte (see column 5, lines 23-32, column 10, lines 21-49),wherein said second sequence binds with the capture sequence (homopolymeric region) of the target analyte forming reporter-analyte hybrid (see column 1, lines 53-61);

2) mixing said first and second components at a temperature and for a time sufficient to enable said first component to bind with the second component (see column 1, lines 53-61, column 10, lines 51-57);

3) incubating this mixture with said immobilized capture probe to enable the first nucleotide sequence to bind to said first component, generating a hybridization pattern (see column 1, lines 61-63, column 10, lines 55-60);

with regard to claim 7-8, Dellinger et al. teach that the time sufficient to enable the second and first component is 1 hour to 3 hours (see column 10, lines 52-55);

with regard to claim 10, Dellinger et al. disclose that the detection of the hybridization signal by scanning the microarray using fluoroimager instrument (see column 10, lines 61-62);

With regard to claim 3-4, 11-17, 24-26, Dellinger et al. also disclose washing the microarray to purge unattached reporter probes after hybridization reaction (see column 10, lines 58-60, column 9, lines 30-34);

With regard to claim 5-6, 9, 13, Dellinger et al. teach that the method comprises hybridization buffer (see column 10, lines 51-55);

With regard to claims 20-21, the mixing of first and second components is conducted on the said microarray or in solution (off microarray) (see column 4, lines 50-66).

With regard to claims 39-42, Dellinger et al. teach a method for gene expression analysis, wherein the fluorescence signals were detected and quantitated using molecular imager (see col. 10, 5-67).

However, Dellinger et al. did not teach use of dendrimer nucleotide sequences.

Nilsen et al. teach a method of claims 1-26, for detecting a specific nucleic acid in a target sample using a dendrimeric probe wherein Nilsen et al. teach that the method comprises (i) contacting a bead having specific probe sequences with a mixture containing a first component comprising labeled target nucleic acid (DNA or RNA) having a capture sequence and a second

component comprising a dendrimer having at least one arm with a nucleotide sequence complementary to the capture sequence of the first component (see column 14, lines 30-35, column 15, lines 37-63); (ii) mixing the first and second components at a temperature to form a bridge between the two components to enable the cross-linking of first component to the second (see column 16, lines 8-11); and incubating the bound mixture with the said bead and detecting signal as an indication of the binding of the target sequence to the specific probe sequence on the bead (see column 16, lines 12-67, column 18, lines 27-51). Nilsen et al. also teach that the method comprises annealing times ranging from 8 minutes (see column 20, lines 24-44) to overnight to 2-6 weeks (see column 3, lines 49-60); detection of hybridization pattern includes detecting the detectable signal (see column 20, lines 38-40); the method comprises hybridization buffer (see column 19, lines 14-26); the unbound dendrimers were removed by a washing step (see column20, lines 35-37); and the isolation of nucleic acid includes spin column (see column20, lines 17-19).

Therefore, it would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made, to modify a method for using microarray hybridization as taught by Dellinger et al. with a method for detecting a nucleic acid sequence using dendrimer as taught by Nilsen et al. to achieve expected advantage of developing an enhanced sensitivity of detecting a target nucleic acid because Nilsen et al. states that "background noise could be generated in conventional assay not only from binding to a solid support, but also from binding of the probe to nonhomologous DNA sequences. An open branching of a dendrimeric DNA have many degrees of freedom in their movement relative to each other and have a high avidity for DNA that is complementary to the non-annealed single stranded sequences (see column 18,

lines 14-26, column 7, lines 14-19). An ordinary practitioner would have been motivated to combine the method of Dellinger et al. with the step of adding dendrimeric probe as taught by Nilsen et al. in order to achieve the expected advantage of developing a sensitive method for detecting a target nucleic acid because the addition of the limitation as taught by Nilsen et al. would reduce non-specific binding and reduce background noise and enhance specific hybridization signal. Transcribing a RNA target to a cDNA represents routine optimization with regard to hybridization assays using DNA, which routine optimization parameters are explicitly recognized in Nilsen et al.. As noted in *In re Aller*, 105 USPQ 233 at 235,More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable conditions by routine experimentation.

Routine optimization is not considered inventive and no evidence has been presented that the utilization of reverse transcription reagents selection performed was other than routine, that the products resulting from the optimization have any unexpected properties, or that the results should be considered unexpected in any way as compared to the closest prior art.

B. Claims 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dellinger et al. (USPN. 5,853,993) in view of Nilsen et al. (USPN. 5, 487,973) as applied to claim 1-26 above, and further in view of Lane et al. (USPN. 5,902,724).

Dellinger in view of Nilsen et al. teach a method for detection and assay on a microarray as discussed above in section 4A.

However neither Dellinger et al. nor Nilsen et al. teach said capture sequence comprising more than one type of base.

Lane et al. teach a method for amplifying detection signals for a target molecule comprising (a) contacting a detection agent with a sample (col. 2, line 65-67, col. 3, line 1), wherein said detection reagent comprises a first portion (capture sequence) that specifically binds to a target molecule or analyte (see col. 3, line 1-2) and a second portion (linear single stranded nucleic acid) (See col. 3, line 2-3); wherein said second portion is complementary to a second single stranded nucleic acid comprising a detectable label (polymeric amplifying moiety (PAM), and the PAM comprises repeating units (homopolymeric (contiguous) or non-homopolymeric non-contiguous)) that are complementary with the second portion of the detection reagent (see col. 4, line 65-67col. 5, 47-67, col. 6, line 1-55).

Therefore, it would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made, to modify a method for using micro array hybridization as taught by Dellinger et al. in view of Nilsen et al. with a capture sequence comprising more than one type of base as taught by Lane et al. to achieve expected advantage of developing an enhanced sensitivity of detecting target nucleic acids on a single microarray. An practitioner would have been motivated to combine the method of Dellinger et al. in view of Nilsen et al. with the step of a capture sequence having more than one type of base as taught by Lane et al for the purpose of enhancing the amplification signal of a target nucleic acid because Lane et al. explicitly taught that the use of repeat units comprising non-contiguous sequences in which at least one base intervenes between subsequences of repeat units (see col. 6, line 24-36) and such modification is considered obvious over the cited prior art in the absence of secondary considerations.

Response to arguments:

5. With regard to the rejection of claims 1-34 under 35 USC 103(a) as being obvious over Dellinger et al. in view of Nilsen et al. further in view of Landers et al. Applicant's arguments are fully considered and found unpersuasive. Applicant argues that the Dellinger et al. reference teaches homopolymeric region, which examiner interpreted as a capture sequence and argue that the homopolymeric regions are common in biologically obtained nucleic acids, that can result in hybridization between the capture sequences and sequences bound to an array, however such hybridization results in non-specific hybridizations. Applicants' arguments are fully considered and found unpersuasive. First, the instant claim 1 recites "capture sequence of said cDNA reagents is a common sequence among said cDNA reagents", which clearly indicates a homopolymeric sequence being a common sequence among all cDNA sequences as supported by the reference cited by the Applicants (Behe MJ, Biochemistry, 1987, Dec. 1, 26: 7870-7875). Second, Applicants arguments regarding non-specific hybridizations is irrelevant because the claims do not exclude the scope of non-specific hybridizations, as the claims do not exclude homopolymeric sequences as capture sequences.

Applicant further argue that the dependent claims require three channel assay that use three different capture sequences and the reference of Dellinger would allow only two types of homopolymeric tails and combining the teachings of Dellinger et al. with Nilsen et al. would not provide a three or more channel approach. Applicant's arguments are fully considered and found unpersuasive because, as discussed above the instant claims do not exclude homopolymeric stretch and also it is noted that the limitations upon which the arguments are based are not present in the claims, that is the limitation that the "three channels require three ***different*** capture sequences" are not present in the independent claims. As noted in the MPEP2145,

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus the three channel approach can have all similar capture sequences.

Applicant further argue that the claims 2 and 22 require a reverse transcription method wherein the RT primer includes the capture sequence and no citation for this has been provided by the examiner in any of the art cited. Applicant's arguments are fully considered and found unpersuasive. Because the RT primer such as (oligo dT) incorporates the capture sequence and it is an inherent property of the RT-primer and Examiner indicated the col. 3, line 20-24, col. 5, line 4-14, that provides mRNA reagent and it is also noted that in col. 6, line 1-12 the use of oligo dT primer to obtain specific mRNA. MPEP 2112 states that "There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure at the time of invention, but only that the subject matter is in fact inherent in the prior art reference." Schering Corp. v. Geneva Pharm. Inc., 339 F.3d 1373, 1377, 67 USPQ2d 1664, 1668 (Fed. Cir. 2003).

Applicant further argue that the newly presented claims 39-40 recite use of more than one type of base in the capture sequences and this is contrary to the teaching of Dellinger et al. reference. Applicant's arguments are fully considered, however, the new limitations in the new claims are subjected to new grounds of rejections as discussed above. The rejection under 35 USC 103(a) as being obvious over Dellinger et al. in view of Nilsen et al. was rewritten to include new claim (claims 39-42) limitations and claims 35-38 are rejected under new grounds. The rejection under 35 USC 103(a) as being obvious over Dellinger et al. in view of Nilsen et al. further in view of Landers et al. is maintained herein for the reasons discussed above.

6. With regard to the rejection under provisional double patenting, Applicant's arguments are fully considered and found unpersuasive because it is not the only remaining rejection in this application. As discussed above the rejection under 103(a) is still pending. Thus the rejection under provisional double patenting is maintained until the issues are resolved.

Conclusion

No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suryaprabha Chunduru whose telephone number is 571-272-0783. The examiner can normally be reached on 8.30A.M. - 4.30P.M , Mon - Friday,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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